WRITTEN REPLY

To: Examiner of the Patent Office

1. Identification of International application
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5. Content of Written Reply

Literature 1 (JP8-333450A) discloses the use of solvent mixtures of water soluble ether and water, or water soluble ketone and water, and the like, when polyimide precursor is synthesized. In said solvent mixtures in the case where the boiling point of said water soluble ether, or said water soluble ketone, is under 100°C, said solvent mixture corresponds to the solvent mixture of solvent L having a lower boiling point of under 100°C and solvent H, having a higher boiling point of 100°C or more.

Nevertheless water has a more volatile solvent than NMP, DMAc, DMF, and the like, these solvents are selected in Claim 1, so that when water is used as solvent H, there is a possibility that the coating produced will be uneven.

In Literature 1, described as follows:

In the examples, THF and methanol (EXAMPLE 1) and, THF and water (EXAMPLE 2) are used as solvents.

The resulting acid varnish is coated on a glass plate, then imidized, after which the solvents are removed, and a film is formed.

In both EXAMPLES 1,2, however, there is too much volatility, leaving the possibility that during the coating process, the surface may become uneven.

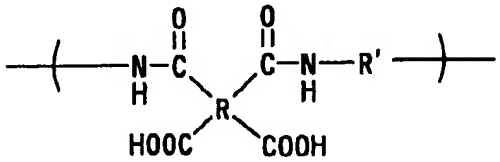
In Literature 2 (JP61-4730A), it is described that nonprotonic solvent such as NMP, DMAc, and the like is described as preferable to be used as solvent for the synthesis of polyamic acid, and further, it is described that other organic solvents can be used for the synthesis of polyamic acid. Nevertheless, use of the solvent mixture of solvent L having a boiling point of under 100°C and the solvent H having boiling point of 100°C or more is not clearly described, and referring to the EXAMPLES in this Literature, it is described that after polyamic acid is synthesized using said solvent, methanol is added to the resulting solvent to coagulate said polyamic acid, after which said coagulated polyamic acid is again dissolved in DMF, NMP, and phenolic solvent.

Claim 1 is amended as follows:

1. A polyimide precursor solution for coating comprising a polyimide precursor which is either a homopolymer, or a copolymer of a polyamide acid made from the reaction between acid component(s) and amine component(s), and having a repetition unit illustrated by the following constitutional formula, said polyimide precursor, being dissolved in a solvent mixture of one or more kind(s) of solvent having a lower boiling point of under 100°C and one or more kind(s) of solvent having a higher boiling point selected from among N-methy-2-pyrrolidone (NMP), N,N-dimethyl form amide (DMF), and N,N-dimethylacetoamide (DMAc),

wherein said higher boiling point solvent is included in said solvent mixture in an amount of 5 to 55% by weight.

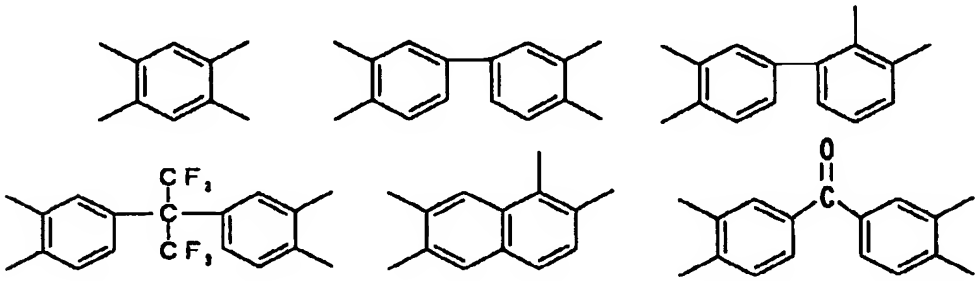
(Constitutional formula 1)



..... (1)

wherein R is a group selected from among the four valence aryl groups illustrated by the following constitutional formulae, and R' is two valence aryl groups having one to four benzene nuclei

(Constitutional formula 2)



When NMP, DMAc and DMF are selected as the solvents to be used in Claim 1 for the synthesis of a polyimide precursor, the resulting reaction solution can be used as a coating solution as it is, and further, since evaporating property of said solution is properly adjusted, a uniform coating film having high quality can be obtained. Still further, when the film produced by partially cyclizing said polyimide precursor of said coating film with heat, is once removed from the cylindrical core mold, film breakage can be prevented.

As described above, the present invention is not disclosed in any of Literature 1 and Literature 2, so that the expert can not easily think of the present invention from said disclosures of Literatures 1 and 2.